1874MNRAS..34..358H

lunar semi-diameter can be found. For the observations of the Eclipses of July 18, 1860, and December 21, 1870, at Greenwich with the great Equatoreal, give as the minimum value for the mean lunar semi-diameter, Hansen's value less 0″·13 and less 0″·20 respectively. This value being still over 1″·60 greater than the occultation semi-diameter, it would appear that irradiation fails to account for the difference found to exist.

To compare these results with those obtained by the Astronomer Royal (*Greenwich Observations*, 1864), they were reduced to the same parallax and semi-diameter there used. As the earlier observations of the series employed by the Astronomer Royal are by no means so good as those made at later periods, when the Altazimuth has been in use, they are omitted. Employing then those made during the period 1850–1860, with an average aperture of a little over four inches, and comparing with the results of the later Greenwich, and the Radcliffe and Cambridge observations, we have, for the disappearances at the dark limb:

Greenwich, 1850–1860	= −2″·45	Greenwich, 1861–1871	= −2″·87
Radcliffe, 1862–1872	= −2″·81	Cambridge, 1861–1869	= −2″·87

Finally combining the whole four series, we have, as reliable values, from 303 observations, reduced from good lunar places, and with fine instruments, for the correction to the telescopic semi-diameter employed by the Astronomer Royal:

Disappearances at the Dark Limb	= −2″·74	from	143 obs.
„ „ Bright Limb	= −1″·29	„	46 obs.
Reappearances at the Dark Limb	= −1″·08	„	58 obs.
„ „ Bright Limb	= +0″·46	„	56 obs.

London,
1874, 30*th March.*

The Solar and Planetary Systems. By Maxwell Hall, Esq.

The author states Bode's law as follows:—"In the solar and planetary systems the mean distances of the planets and satellites do not greatly differ in value from the terms of the series:

4λ, 7λ, 10λ, 16λ, 28λ, 52λ, 100λ, 196λ, 388λ, &c.,

where λ has different values in different systems. But there may be more than one, or there may be no planet or satellite near any of the above theoretical distances." And he then proceeds to determine λ in miles for the planetary system, and for the Jovian, Saturnian, and Uranian satellite systems respectively.

Downloaded from http://mnras.oxfordjournals.org/ at University of Manitoba on June 9, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System

1874MNRAS..34..359B

Some of the numerical coincidences are very close, thus in the Uranian system, taking the distances to be 7λ, 10λ, 16λ, and 28λ, the first three satellites give $\lambda = 17600$, 17100, and 17600 miles respectively, (but the fourth satellite gives $\lambda = 13400$ miles).

He then states a second proposition: "Twice the unit of length in any system is approximately equal to that distance which corresponds to the period of rotation of the central body of that system," or say

$$\lambda = 1580\, M^{\frac{1}{3}} P^{\frac{2}{3}}$$

where M = mass of central body in terms of the mass of the earth, P period of the axial rotation in hours, λ in miles as before. It thus appears that dividing the value of λ for any system by the value of $M^{\frac{1}{3}} P^{\frac{2}{3}}$ for the central body of that system, the quotient should be 1580. For the Solar, Jovian, and Saturnian systems, the quotients are 1790, 1340, 1720, mean 1620. For the Earth $\lambda = 13100$ miles; so that regarding the Moon as a fourth satellite (the three interior ones missing) its theoretical distance is 210,000 miles. The paper concludes with some considerations as to M. Lescarbault's planet *Vulcan*.

Memorandum of Observations of Jupiter made during the month of April 1874. By John Brett, Esq.

I wish to call the attention of the Fellows to a particular feature of *Jupiter's* disk, which appears to me very well defined at the present time, and which seems to afford evidence respecting the physical condition of the planet.

The large white patches which occur on and about the equatoreal zone, and interrupt the continuity of the dark belts, are well known to all observers, and the particular point in connection with them, to which I beg leave to call attention is, that *they cast shadows;* that is to say, the light patches are bounded on the side farthest from the Sun by a dark border shaded off softly towards the light, and showing in a distinct manner that the patches are projected or relieved from the body of the planet.

The evidence which this observation is calculated to afford refers to the question whether the opaque body of the planet is seen in the dark belts or the bright ones, and points to the conclusion that it is not seen at all in either of them, but that all we see of *Jupiter* consists of semi-transparent materials.

The particular fact from which this inference would be drawn is, that the dark sides of the suspended or projected masses are not sufficiently hard or sharply defined for shadows falling upon an opaque surface, neither are they sharper upon the light background than upon the dark.

Downloaded from http://mnras.oxfordjournals.org/ at University of Manitoba on June 9, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System